



## SEQUENCE LISTING

<110> WELLS, Patrick  
LEIPER, James  
WHITLEY, Guy  
CHARLES, Ian

<120> DIMETHYLARGININE DIMETHYLAMINOHYDROLASES

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<140> US 09/889,733

<141> 2001-09-14

<150> GB 99017505.5

<151> 1999-01-26

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<151> 1999-06-04

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<170> PatentIn version 3.0

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Val Val Arg Ala Leu Pro Glu Ser Leu Cys Gln His Ala Leu Arg Ser  
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gcc aag ggc gag gag gtg gac gtc gcc cgc gcg gaa cgg cag cac cag 144  
Ala Lys Gly Glu Glu Val Asp Val Ala Arg Ala Glu Arg Gln His Gln  
35 40 45

ctc tac gtg ggc gtg ctg ggc agc aag ctg ggg ctg cag gtg gtg gag 192  
Leu Tyr Val Gly Val Leu Gly Ser Lys Leu Gly Leu Gln Val Val Glu  
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ctg ccg gcc gac gag agc ctt ccg gac tgc gtc ttc gtg gag gac gtg 240  
Leu Pro Ala Asp Glu Ser Leu Pro Asp Cys Val Phe Val Glu Asp Val  
65 70 75 80

gcc gtg gtg tgc gag gag acg gcc ctc atc acc cga ccc ggg gcg ccg 288  
Ala Val Val Cys Glu Glu Thr Ala Leu Ile Thr Arg Pro Gly Ala Pro  
85 90 95

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| agc cgg agg aag gag gtt gac atg atg aaa gaa gca tta gaa aaa ctt | 336 |
| Ser Arg Arg Lys Glu Val Asp Met Met Lys Glu Ala Leu Glu Lys Leu |     |
| 100 105 110   |     |
| cag ctc aat ata gta gag atg aaa gat gaa aat gca act tta gat ggc | 384 |
| Gln Leu Asn Ile Val Glu Met Lys Asp Glu Asn Ala Thr Leu Asp Gly |     |
| 115 120 125   |     |
| gga gat gtt tta ttc aca ggc aga gaa ttt ttt gtg ggc ctt tcc aaa | 432 |
| Gly Asp Val Leu Phe Thr Gly Arg Glu Phe Phe Val Gly Leu Ser Lys |     |
| 130 135 140   |     |
| agg aca aat caa cga ggt gct gaa atc ttg gct gat act ttt aag gac | 480 |
| Arg Thr Asn Gln Arg Gly Ala Glu Ile Leu Ala Asp Thr Phe Lys Asp |     |
| 145 150 155 160   |     |
| tat gca gtc tcc aca gtg cca gtg gca gat ggg ttg cat ttg aag agt | 528 |
| Tyr Ala Val Ser Thr Val Pro Val Ala Asp Gly Leu His Leu Lys Ser |     |
| 165 170 175   |     |
| ttc tgc agc atg gct ggg cct aac ctg atc gca att ggg tct agt gaa | 576 |
| Phe Cys Ser Met Ala Gly Pro Asn Leu Ile Ala Ile Gly Ser Ser Glu |     |
| 180 185 190   |     |
| tct gca cag aag gcc ctt aag atc atg caa cag atg agt gac cac cgc | 624 |
| Ser Ala Gln Lys Ala Leu Lys Ile Met Gln Gln Met Ser Asp His Arg |     |
| 195 200 205   |     |
| tac gac aaa ctc act gtg cct gat gac ata gca gca aac tgt ata tat | 672 |
| Tyr Asp Lys Leu Thr Val Pro Asp Asp Ile Ala Ala Asn Cys Ile Tyr |     |
| 210 215 220   |     |
| cta aat atc ccc aac aaa ggg cac gtc ttg ctg cac cga acc ccg gaa | 720 |
| Leu Asn Ile Pro Asn Lys Gly His Val Leu Leu His Arg Thr Pro Glu |     |
| 225 230 235 240   |     |
| gag tat cca gaa agt gca aag gtt tat gag aaa ctg aag gac cat atg | 768 |
| Glu Tyr Pro Glu Ser Ala Lys Val Tyr Glu Lys Leu Lys Asp His Met |     |
| 245 250 255   |     |
| ctg atc ccc gtg agc atg tct gaa ctg gaa aag gtg gat ggg ctg ctc | 816 |
| Leu Ile Pro Val Ser Met Ser Glu Leu Glu Lys Val Asp Gly Leu Leu |     |
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| acc tgc tgc tca gtt tta att aac aag aag gta gac tcc tga         | 858 |
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 Glu Tyr Pro Glu Ser Ala Lys Val Tyr Glu Lys Leu Lys Asp His Met  
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| atg | ggg | acg | ccg | ggg | gag | ggg | ctg | ggc | cgc | tgc | tcc | cat | gcc | ctg | atc | 48 |
| Met | Gly | Thr | Pro | Gly | Glu | Gly | Leu | Gly | Arg | Cys | Ser | His | Ala | Leu | Ile |    |
| 1   |     |     |     | 5   |     |     |     |     | 10  |     |     |     |     | 15  |     |    |

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|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|----|
| cgg | gga | gtc | cca | gag | agc | ctg | gcg | tcg | ggg | gaa | ggt | gcg | ggg | gct | ggc | 96 |
| Arg | Gly | Val | Pro | Glu | Ser | Leu | Ala | Ser | Gly | Glu | Gly | Ala | Gly | Ala | Gly |    |
|     |     |     | 20  |     |     |     |     | 25  |     |     |     |     | 30  |     |     |    |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| ctt | ccc | gct | ctg | gat | ctg | gcc | aaa | gct | caa | agg | gag | cac | ggg | gtg | ctg | 144 |
| Leu | Pro | Ala | Leu | Asp | Leu | Ala | Lys | Ala | Gln | Arg | Glu | His | Gly | Val | Leu |     |
|     |     | 35  |     |     |     |     | 40  |     |     |     |     | 45  |     |     |     |     |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| gga | ggt | aaa | ctg | agg | caa | cga | ctg | ggg | cta | cag | ctg | cta | gaa | ctg | cca | 192 |
| Gly | Gly | Lys | Leu | Arg | Gln | Arg | Leu | Gly | Leu | Gln | Leu | Leu | Glu | Leu | Pro |     |
|     | 50  |     |     |     |     | 55  |     |     |     |     | 60  |     |     |     |     |     |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| cct | gag | gag | tca | ttg | ccg | ctg | gga | ccg | ctg | ctt | ggc | gac | acg | gcc | gtg | 240 |
| Pro | Glu | Glu | Ser | Leu | Pro | Leu | Gly | Pro | Leu | Leu | Gly | Asp | Thr | Ala | Val |     |
| 65  |     |     |     |     | 70  |     |     |     | 75  |     |     |     |     |     | 80  |     |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| atc | caa | ggg | gac | acg | gcc | cta | atc | acg | cgg | ccc | tgg | agc | ccc | gct | cgt | 288 |
| Ile | Gln | Gly | Asp | Thr | Ala | Leu | Ile | Thr | Arg | Pro | Trp | Ser | Pro | Ala | Arg |     |
|     |     |     | 85  |     |     |     |     |     | 90  |     |     |     |     | 95  |     |     |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| agg | cca | gag | gtc | gat | gga | gtc | cgc | aaa | gcc | ctg | caa | gac | ctg | ggg | ctc | 336 |
| Arg | Pro | Glu | Val | Asp | Gly | Val | Arg | Lys | Ala | Leu | Gln | Asp | Leu | Gly | Leu |     |
|     |     |     | 100 |     |     |     |     | 105 |     |     |     |     | 110 |     |     |     |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| cga | att | gtg | gaa | ata | gga | gac | gag | aac | gcg | acg | ctg | gat | ggc | act | gac | 384 |
| Arg | Ile | Val | Glu | Ile | Gly | Asp | Glu | Asn | Ala | Thr | Leu | Asp | Gly | Thr | Asp |     |
|     |     | 115 |     |     |     |     | 120 |     |     |     |     | 125 |     |     |     |     |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| gtt | ctc | ttc | acc | ggc | cgg | gag | ttt | ttc | gta | ggc | ctc | tcc | aaa | tgg | acc | 432 |
| Val | Leu | Phe | Thr | Gly | Arg | Glu | Phe | Phe | Val | Gly | Leu | Ser | Lys | Trp | Thr |     |
|     | 130 |     |     |     |     | 135 |     |     |     |     | 140 |     |     |     |     |     |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| aat | cac | cga | gga | gct | gag | atc | gtg | gcg | gac | acg | ttc | cgg | gac | ttc | gcc | 480 |
| Asn | His | Arg | Gly | Ala | Glu | Ile | Val | Ala | Asp | Thr | Phe | Arg | Asp | Phe | Ala |     |
| 145 |     |     |     |     | 150 |     |     |     |     | 155 |     |     |     |     | 160 |     |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| gtc | tcc | act | gtg | cca | gtc | tcg | ggt | ccc | tcc | cac | ctg | cgc | ggt | ctc | tgc | 528 |
| Val | Ser | Thr | Val | Pro | Val | Ser | Gly | Pro | Ser | His | Leu | Arg | Gly | Leu | Cys |     |
|     |     |     | 165 |     |     |     |     | 170 |     |     |     |     |     | 175 |     |     |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| ggc | atg | ggg | gga | cct | cgc | act | gtt | gtg | gca | ggc | agc | agc | gac | gct | gcc | 576 |
| Gly | Met | Gly | Gly | Pro | Arg | Thr | Val | Val | Ala | Gly | Ser | Ser | Asp | Ala | Ala |     |
|     |     |     | 180 |     |     |     |     | 185 |     |     |     |     | 190 |     |     |     |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| caa | aag | gct | gtc | cgg | gca | atg | gca | gtg | ctg | aca | gat | cac | cca | tat | gcc | 624 |
| Gln | Lys | Ala | Val | Arg | Ala | Met | Ala | Val | Leu | Thr | Asp | His | Pro | Tyr | Ala |     |
|     |     | 195 |     |     |     |     | 200 |     |     |     |     | 205 |     |     |     |     |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| tcc | ctg | acc | ctc | cca | gat | gac | gca | gct | gct | gac | tgt | ctc | ttt | ctt | cgt | 672 |
| Ser | Leu | Thr | Leu | Pro | Asp | Asp | Ala | Ala | Ala | Asp | Cys | Leu | Phe | Leu | Arg |     |
| 210 |     |     |     |     |     | 215 |     |     |     |     | 220 |     |     |     |     |     |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| cct | ggg | ttg | cct | ggt | gtg | ccc | cct | ttc | ctc | ctg | cac | cgt | gga | ggt | ggg | 720 |
| Pro | Gly | Leu | Pro | Gly | Val | Pro | Pro | Phe | Leu | Leu | His | Arg | Gly | Gly | Gly |     |
| 225 |     |     |     |     | 230 |     |     |     |     | 235 |     |     |     |     | 240 |     |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| gat | ctg | ccc | aac | agc | cag | gag | gca | ctg | cag | aag | ctc | tct | gat | gtc | acc | 768 |
| Asp | Leu | Pro | Asn | Ser | Gln | Glu | Ala | Leu | Gln | Lys | Leu | Ser | Asp | Val | Thr |     |
|     |     |     | 245 |     |     |     |     |     | 250 |     |     |     |     | 255 |     |     |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| ctg | gta | cct | gtg | tcc | tgc | tca | gaa | ctg | gag | aaa | gct | ggc | gcc | ggg | ctc | 816 |
| Leu | Val | Pro | Val | Ser | Cys | Ser | Glu | Leu | Glu | Lys | Ala | Gly | Ala | Gly | Leu |     |
|     |     | 260 |     |     |     |     |     | 265 |     |     |     |     | 270 |     |     |     |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |  |  |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|--|-----|
| agc | tcc | ctc | tgc | ttg | gtg | ctc | agc | aca | cgc | ccc | cac | agc | tga |  |  | 858 |
| Ser | Ser | Leu | Cys | Leu | Val | Leu | Ser | Thr | Arg | Pro | His | Ser |     |  |  |     |
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| 1       |     |     |     | 5   |     |     |     |     | 10  |     |     |     |     | 15  |     |  |
| Arg     | Gly | Val | Pro | Glu | Ser | Leu | Ala | Ser | Gly | Glu | Gly | Ala | Gly | Ala | Gly |  |
|         |     |     | 20  |     |     |     |     | 25  |     |     |     |     | 30  |     |     |  |
| Leu     | Pro | Ala | Leu | Asp | Leu | Ala | Lys | Ala | Gln | Arg | Glu | His | Gly | Val | Leu |  |
|         |     | 35  |     |     |     |     | 40  |     |     |     |     | 45  |     |     |     |  |
| Gly     | Gly | Lys | Leu | Arg | Gln | Arg | Leu | Gly | Leu | Gln | Leu | Leu | Glu | Leu | Pro |  |
|         | 50  |     |     |     |     | 55  |     |     |     |     | 60  |     |     |     |     |  |
| Pro     | Glu | Glu | Ser | Leu | Pro | Leu | Gly | Pro | Leu | Leu | Gly | Asp | Thr | Ala | Val |  |
| 65      |     |     |     |     | 70  |     |     |     |     | 75  |     |     |     |     | 80  |  |
| Ile     | Gln | Gly | Asp | Thr | Ala | Leu | Ile | Thr | Arg | Pro | Trp | Ser | Pro | Ala | Arg |  |
|         |     |     | 85  |     |     |     |     |     | 90  |     |     |     |     | 95  |     |  |
| Arg     | Pro | Glu | Val | Asp | Gly | Val | Arg | Lys | Ala | Leu | Gln | Asp | Leu | Gly | Leu |  |
|         |     |     | 100 |     |     |     |     | 105 |     |     |     |     | 110 |     |     |  |
| Arg     | Ile | Val | Glu | Ile | Gly | Asp | Glu | Asn | Ala | Thr | Leu | Asp | Gly | Thr | Asp |  |
|         |     |     | 115 |     |     |     | 120 |     |     |     |     | 125 |     |     |     |  |
| Val     | Leu | Phe | Thr | Gly | Arg | Glu | Phe | Phe | Val | Gly | Leu | Ser | Lys | Trp | Thr |  |
|         | 130 |     |     |     |     | 135 |     |     |     |     | 140 |     |     |     |     |  |
| Asn     | His | Arg | Gly | Ala | Glu | Ile | Val | Ala | Asp | Thr | Phe | Arg | Asp | Phe | Ala |  |
| 145     |     |     |     |     | 150 |     |     |     |     | 155 |     |     |     |     | 160 |  |

Val Ser Thr Val Pro Val Ser Gly Pro Ser His Leu Arg Gly Leu Cys  
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 Gly Met Gly Gly Pro Arg Thr Val Val Ala Gly Ser Ser Asp Ala Ala  
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 Gln Lys Ala Val Arg Ala Met Ala Val Leu Thr Asp His Pro Tyr Ala  
 195 200 205  
 Ser Leu Thr Leu Pro Asp Asp Ala Ala Ala Asp Cys Leu Phe Leu Arg  
 210 215 220  
 Pro Gly Leu Pro Gly Val Pro Pro Phe Leu Leu His Arg Gly Gly Gly  
 225 230 235 240  
 Asp Leu Pro Asn Ser Gln Glu Ala Leu Gln Lys Leu Ser Asp Val Thr  
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 Glu Gly Leu Val Thr His Val Glu Arg Glu Gln Val Asp His Gly Leu  
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 gcc ctc gaa cag tgg gac gcc tac gtc gag gcc ctc gga gca cac ggc 144  
 Ala Leu Glu Gln Trp Asp Ala Tyr Val Glu Ala Leu Gly Ala His Gly  
 35 40 45  
 tgg gag act ctg gag gtg gac ccg gcc gag tac tgt ccg gac tcg gtc 192  
 Trp Glu Thr Leu Glu Val Asp Pro Ala Glu Tyr Cys Pro Asp Ser Val  
 50 55 60  
 ttc gtc gag gac gcc gtc gtc gtg ttc cgc aac gtc gcg ctg atc acg 240  
 Phe Val Glu Asp Ala Val Val Val Phe Arg Asn Val Ala Leu Ile Thr  
 65 70 75 80  
 cgg ccc ggc gcc gag tcg cgg cgc gcg gag acg gcc ggc gtc gag gag 288  
 Arg Pro Gly Ala Glu Ser Arg Arg Ala Glu Thr Ala Gly Val Glu Glu

| 85   | 90 | 95 |     |
|--|----|----|-----|
| gcc gtg gcc cgg ctc ggc tgc tgc gtg aac tgg gtg tgg gag ccg ggc<br>Ala Val Ala Arg Leu Gly Cys Ser Val Asn Trp Val Trp Glu Pro Gly<br>100 105 110                      |    |    | 336 |
| acc ctg gac ggc ggc gac gtc ctg aag atc ggc gac acg atc tac gtg<br>Thr Leu Asp Gly Gly Asp Val Leu Lys Ile Gly Asp Thr Ile Tyr Val<br>115 120 125                      |    |    | 384 |
| gga cgc ggc ggc cgg acc aac gcg gcc ggt gtc cag cag ttg cgg gcg<br>Gly Arg Gly Gly Arg Thr Asn Ala Ala Gly Val Gln Gln Leu Arg Ala<br>130 135 140                      |    |    | 432 |
| gcg ttc gag ccg ctg ggc gcc cgg gtc gtc gcc gtg ccc gtg agc aag<br>Ala Phe Glu Pro Leu Gly Ala Arg Val Val Ala Val Pro Val Ser Lys<br>145 150 155 160                  |    |    | 480 |
| gtg ctg cat ctg aag tgc gcg gtc acc gcg ctg ccg gac ggg acg gtg<br>Val Leu His Leu Lys Ser Ala Val Thr Ala Leu Pro Asp Gly Thr Val<br>165 170 175                      |    |    | 528 |
| atc ggg cac atc ccg ctg acg gac gtg ccc tgc ctg ttc ccc cgt ttc<br>Ile Gly His Ile Pro Leu Thr Asp Val Pro Ser Leu Phe Pro Arg Phe<br>180 185 190                      |    |    | 576 |
| ctg ccg gtg ccg gag gag tgc ggg gcg cac gtg gtg ctg ctc ggc ggg<br>Leu Pro Val Pro Glu Glu Ser Gly Ala His Val Val Leu Leu Gly Gly<br>195 200 205                      |    |    | 624 |
| agc agg ctg ctg atg gcg gcg agc gcg ccc aag acg gcg gag ctg ctc<br>Ser Arg Leu Leu Met Ala Ala Ser Ala Pro Lys Thr Ala Glu Leu Leu<br>210 215 220                      |    |    | 672 |
| gcc gat ctc ggt cac gag ccg gtg ctc gtc gac atc ggg gag ttc gag<br>Ala Asp Leu Gly His Glu Pro Val Leu Val Asp Ile Gly Glu Phe Glu<br>225 230 235 240                  |    |    | 720 |
| aag ctg gag ggc tgt gtg acg tgc ctc tgc gtc agg ctg cgc gag ctg<br>Lys Leu Glu Gly Cys Val Thr Cys Leu Ser Val Arg Leu Arg Glu Leu<br>245 250 255                      |    |    | 768 |
| tac gac tga<br>Tyr Asp   |    |    | 777 |
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| <400> 6<br>Val Pro Ser Lys Lys Ala Leu Val Arg Arg Pro Ser Pro Arg Leu Ala<br>1 5 10 15<br>Glu Gly Leu Val Thr His Val Glu Arg Glu Gln Val Asp His Gly Leu<br>20 25 30 |    |    |     |

Ala Leu Glu Gln Trp Asp Ala Tyr Val Glu Ala Leu Gly Ala His Gly  
35 40 45

Trp Glu Thr Leu Glu Val Asp Pro Ala Glu Tyr Cys Pro Asp Ser Val  
50 55 60

Phe Val Glu Asp Ala Val Val Val Phe Arg Asn Val Ala Leu Ile Thr  
65 70 75 80

Arg Pro Gly Ala Glu Ser Arg Arg Ala Glu Thr Ala Gly Val Glu Glu  
85 90 95

Ala Val Ala Arg Leu Gly Cys Ser Val Asn Trp Val Trp Glu Pro Gly  
100 105 110

Thr Leu Asp Gly Gly Asp Val Leu Lys Ile Gly Asp Thr Ile Tyr Val  
115 120 125

Gly Arg Gly Gly Arg Thr Asn Ala Ala Gly Val Gln Gln Leu Arg Ala  
130 135 140

Ala Phe Glu Pro Leu Gly Ala Arg Val Val Ala Val Pro Val Ser Lys  
145 150 155 160

Val Leu His Leu Lys Ser Ala Val Thr Ala Leu Pro Asp Gly Thr Val  
165 170 175

Ile Gly His Ile Pro Leu Thr Asp Val Pro Ser Leu Phe Pro Arg Phe  
180 185 190

Leu Pro Val Pro Glu Glu Ser Gly Ala His Val Val Leu Leu Gly Gly  
195 200 205

Ser Arg Leu Leu Met Ala Ala Ser Ala Pro Lys Thr Ala Glu Leu Leu  
210 215 220

Ala Asp Leu Gly His Glu Pro Val Leu Val Asp Ile Gly Glu Phe Glu  
225 230 235 240

Lys Leu Glu Gly Cys Val Thr Cys Leu Ser Val Arg Leu Arg Glu Leu  
245 250 255

Tyr Asp

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Met Phe Lys His Ile Ile Ala Arg Thr Pro Ala Arg Ser Leu Val Asp  
1 5 10 15



|   |     |
|---|-----|
| ggc ctg acc tcc agc cac ctc ggc aag ccg gac tac gcc aag gcc ctg | 96  |
| Gly Leu Thr Ser Ser His Leu Gly Lys Pro Asp Tyr Ala Lys Ala Leu |     |
| 20 25 30  |     |
| gag cag cac aac gcc tac atc cgc gcc ttg cag acc tgc gac gtg gac | 144 |
| Glu Gln His Asn Ala Tyr Ile Arg Ala Leu Gln Thr Cys Asp Val Asp |     |
| 35 40 45  |     |
| atc acc ctg ctg ccg ccg gac gaa cgc ttc ccc gac tcg gtg ttc gtc | 192 |
| Ile Thr Leu Leu Pro Pro Asp Glu Arg Phe Pro Asp Ser Val Phe Val |     |
| 50 55 60  |     |
| gag gac ccg gtg ctc tgc acc tcg cgc tgc gcc atc atc acc cgc ccc | 240 |
| Glu Asp Pro Val Leu Cys Thr Ser Arg Cys Ala Ile Ile Thr Arg Pro |     |
| 65 70 75 80   |     |
| ggc gcc gaa tcg ccg cgc ggc gag acc gag atc atc gag gaa acc gtg | 288 |
| Gly Ala Glu Ser Arg Arg Gly Glu Thr Glu Ile Ile Glu Glu Thr Val |     |
| 85 90 95  |     |
| cag cgc ttc tat ccg ggc aag gtc gag cgc atc gag gca ccc ggc acg | 336 |
| Gln Arg Phe Tyr Pro Gly Lys Val Glu Arg Ile Glu Ala Pro Gly Thr |     |
| 100 105 110   |     |
| gtg gaa gcc ggc gac atc atg atg gtc ggc gac cac ttc tac atc ggc | 384 |
| Val Glu Ala Gly Asp Ile Met Met Val Gly Asp His Phe Tyr Ile Gly |     |
| 115 120 125   |     |
| gaa tcg gcc cgc acc aac gcc gag ggc gcc cgg cag atg atc gcg atc | 432 |
| Glu Ser Ala Arg Thr Asn Ala Glu Gly Ala Arg Gln Met Ile Ala Ile |     |
| 130 135 140   |     |
| ctg gag aaa cat ggc ctc agc ggc tcg gtg gtg cgc ctg gaa aag gtc | 480 |
| Leu Glu Lys His Gly Leu Ser Gly Ser Val Val Arg Leu Glu Lys Val |     |
| 145 150 155 160   |     |
| ctg cac ctg aag acc ggg ctc gcc tac ctg gaa cac aac aac ctg ctg | 528 |
| Leu His Leu Lys Thr Gly Leu Ala Tyr Leu Glu His Asn Asn Leu Leu |     |
| 165 170 175   |     |
| gcc gcc ggc gag ttc gtc agc aag ccg gag ttc cag gac ttc aac atc | 576 |
| Ala Ala Gly Glu Phe Val Ser Lys Pro Glu Phe Gln Asp Phe Asn Ile |     |
| 180 185 190   |     |
| atc gag atc ccc gaa gag gag tcc tac gcc gcc aac tgc atc tgg gtc | 624 |
| Ile Glu Ile Pro Glu Glu Glu Ser Tyr Ala Ala Asn Cys Ile Trp Val |     |
| 195 200 205   |     |
| aac gaa agg gtg atc atg ccc gcc ggc tat ccc cgg acc cgc gag aag | 672 |
| Asn Glu Arg Val Ile Met Pro Ala Gly Tyr Pro Arg Thr Arg Glu Lys |     |
| 210 215 220   |     |
| atc gcc cgc ctc ggc tac cgg gtg atc gag gtg gac acc tcc gaa tat | 720 |
| Ile Ala Arg Leu Gly Tyr Arg Val Ile Glu Val Asp Thr Ser Glu Tyr |     |
| 225 230 235 240   |     |

cgc aag atc gac ggc ggc gtc agt tgc atg tcg ctg cgc ttc tga  
 Arg Lys Ile Asp Gly Gly Val Ser Cys Met Ser Leu Arg Phe  
 245 250

765

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 <213> P. aeruginosa

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 Gly Leu Thr Ser Ser His Leu Gly Lys Pro Asp Tyr Ala Lys Ala Leu  
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 35 40 45  
 Ile Thr Leu Leu Pro Pro Asp Glu Arg Phe Pro Asp Ser Val Phe Val  
 50 55 60  
 Glu Asp Pro Val Leu Cys Thr Ser Arg Cys Ala Ile Ile Thr Arg Pro  
 65 70 75 80  
 Gly Ala Glu Ser Arg Arg Gly Glu Thr Glu Ile Ile Glu Glu Thr Val  
 85 90 95  
 Gln Arg Phe Tyr Pro Gly Lys Val Glu Arg Ile Glu Ala Pro Gly Thr  
 100 105 110  
 Val Glu Ala Gly Asp Ile Met Met Val Gly Asp His Phe Tyr Ile Gly  
 115 120 125  
 Glu Ser Ala Arg Thr Asn Ala Glu Gly Ala Arg Gln Met Ile Ala Ile  
 130 135 140  
 Leu Glu Lys His Gly Leu Ser Gly Ser Val Val Arg Leu Glu Lys Val  
 145 150 155 160  
 Leu His Leu Lys Thr Gly Leu Ala Tyr Leu Glu His Asn Asn Leu Leu  
 165 170 175  
 Ala Ala Gly Glu Phe Val Ser Lys Pro Glu Phe Gln Asp Phe Asn Ile  
 180 185 190  
 Ile Glu Ile Pro Glu Glu Glu Ser Tyr Ala Ala Asn Cys Ile Trp Val  
 195 200 205  
 Asn Glu Arg Val Ile Met Pro Ala Gly Tyr Pro Arg Thr Arg Glu Lys  
 210 215 220  
 Ile Ala Arg Leu Gly Tyr Arg Val Ile Glu Val Asp Thr Ser Glu Tyr  
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 Arg Lys Ile Asp Gly Gly Val Ser Cys Met Ser Leu Arg Phe

xo  
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245

250

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ctg cgc aaa gtg atg gtc tgc tcg ccc gga ctc gcc cac cag cgc ctg 96  
 Leu Arg Lys Val Met Val Cys Ser Pro Gly Leu Ala His Gln Arg Leu  
 20 25 30

acc ccg agc aac tgc gac gag ttg ctg ttc gac gac gtg atc tgg gtg 144  
 Thr Pro Ser Asn Cys Asp Glu Leu Leu Phe Asp Asp Val Ile Trp Val  
 35 40 45

aac cag gcc aag cgc gac cac ttc gac ttc gtc acc aag atg cgc gag 192  
 Asn Gln Ala Lys Arg Asp His Phe Asp Phe Val Thr Lys Met Arg Glu  
 50 55 60

cgc ggc atc gac gtc ctc gag atg cac aat ctg ctg acc gag acc atc 240  
 Arg Gly Ile Asp Val Leu Glu Met His Asn Leu Leu Thr Glu Thr Ile  
 65 70 75 80

cag aac ccg gaa gcg ctg aag tgg atc ctc gat cgc aag atc acc gcc 288  
 Gln Asn Pro Glu Ala Leu Lys Trp Ile Leu Asp Arg Lys Ile Thr Ala  
 85 90 95

gac agc gtc ggc ctg ggc ctg acc agc gag ctg cgc tcc tgg ctg gag 336  
 Asp Ser Val Gly Leu Gly Leu Thr Ser Glu Leu Arg Ser Trp Leu Glu  
 100 105 110

agc ctg gag ccg cgc aag ctg gcc gag tac ctg atc ggc ggc gtc gcc 384  
 Ser Leu Glu Pro Arg Lys Leu Ala Glu Tyr Leu Ile Gly Gly Val Ala  
 115 120 125

gct gac gac ctg ccc gcc agc gaa ggc gcc aac atc ctc aag atg tac 432  
 Ala Asp Asp Leu Pro Ala Ser Glu Gly Ala Asn Ile Leu Lys Met Tyr  
 130 135 140

cgc gag tac ctg ggc cat tcc agc ttc ctg ctg ccg ccg ttg ccg aac 480  
 Arg Glu Tyr Leu Gly His Ser Ser Phe Leu Leu Pro Pro Leu Pro Asn  
 145 150 155 160

acc cag ttc acc cgc gac acc act tgc tgg atc tac ggc ggc gtg acc 528  
 Thr Gln Phe Thr Arg Asp Thr Thr Cys Trp Ile Tyr Gly Gly Val Thr  
 165 170 175

ctg aac ccg atg tac tgg ccg gcg cga cga cag gaa acc ctg ctg acc 576

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |      |  |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|--|
| Leu | Asn | Pro | Met | Tyr | Trp | Pro | Ala | Arg | Arg | Gln | Glu | Thr | Leu | Leu | Thr |      |  |
|     |     |     | 180 |     |     |     |     | 185 |     |     |     |     | 190 |     |     |      |  |
| acc | gcc | atc | tac | aag | ttc | cac | ccc | gag | ttc | gcc | aac | gcc | gag | ttc | gag | 624  |  |
| Thr | Ala | Ile | Tyr | Lys | Phe | His | Pro | Glu | Phe | Ala | Asn | Ala | Glu | Phe | Glu |      |  |
|     |     | 195 |     |     |     |     | 200 |     |     |     | 205 |     |     |     |     |      |  |
| atc | tgg | tac | ggc | gac | ccg | gac | aag | gac | cac | ggc | tcc | tcg | acc | ctg | gaa | 672  |  |
| Ile | Trp | Tyr | Gly | Asp | Pro | Asp | Lys | Asp | His | Gly | Ser | Ser | Thr | Leu | Glu |      |  |
|     | 210 |     |     |     |     | 215 |     |     |     |     | 220 |     |     |     |     |      |  |
| ggc | ggc | gac | gtg | atg | ccg | atc | ggc | aac | ggc | gtg | gtc | ctg | atc | ggc | atg | 720  |  |
| Gly | Gly | Asp | Val | Met | Pro | Ile | Gly | Asn | Gly | Val | Val | Leu | Ile | Gly | Met |      |  |
| 225 |     |     |     |     | 230 |     |     |     |     | 235 |     |     |     |     | 240 |      |  |
| ggc | gag | cgc | tcc | tcg | cgc | cag | gcc | atc | ggc | gag | gtc | gcc | cag | tcg | ctg | 768  |  |
| Gly | Glu | Arg | Ser | Ser | Arg | Gln | Ala | Ile | Gly | Gln | Val | Ala | Gln | Ser | Leu |      |  |
|     |     |     | 245 |     |     |     |     | 250 |     |     |     |     | 255 |     |     |      |  |
| ttc | gcc | aag | ggc | gcc | gcc | gag | cgg | gtg | atc | gtc | gcc | ggc | ctg | ccg | aag | 816  |  |
| Phe | Ala | Lys | Gly | Ala | Ala | Glu | Arg | Val | Ile | Val | Ala | Gly | Leu | Pro | Lys |      |  |
|     |     | 260 |     |     |     |     | 265 |     |     |     |     |     | 270 |     |     |      |  |
| tcc | cgc | gcc | gcg | atg | cac | ctg | gac | acc | gtg | ttc | agc | ttc | tgc | gac | cgc | 864  |  |
| Ser | Arg | Ala | Ala | Met | His | Leu | Asp | Thr | Val | Phe | Ser | Phe | Cys | Asp | Arg |      |  |
|     |     | 275 |     |     |     |     | 280 |     |     |     |     | 285 |     |     |     |      |  |
| gac | ctg | gtc | acg | gtc | ttc | ccg | gaa | gtg | gtc | aag | gaa | atc | gtg | ccc | ttc | 912  |  |
| Asp | Leu | Val | Thr | Val | Phe | Pro | Glu | Val | Val | Lys | Glu | Ile | Val | Pro | Phe |      |  |
|     | 290 |     |     |     |     | 295 |     |     |     |     | 300 |     |     |     |     |      |  |
| agc | ctg | cgc | ccc | gat | ccg | agc | agc | ccc | tac | ggc | atg | aac | atc | cgc | cgc | 960  |  |
| Ser | Leu | Arg | Pro | Asp | Pro | Ser | Ser | Pro | Tyr | Gly | Met | Asn | Ile | Arg | Arg |      |  |
| 305 |     |     |     |     | 310 |     |     |     |     | 315 |     |     |     |     | 320 |      |  |
| gag | gag | aaa | acc | ttc | ctc | gaa | gtg | gtc | gcc | gaa | tcc | ctc | ggc | ctg | aag | 1008 |  |
| Glu | Glu | Lys | Thr | Phe | Leu | Glu | Val | Val | Ala | Glu | Ser | Leu | Gly | Leu | Lys |      |  |
|     |     |     | 325 |     |     |     |     |     | 330 |     |     |     |     | 335 |     |      |  |
| aaa | ctg | cgc | gtg | gtc | gag | acc | ggc | ggc | aac | agc | ttc | gcc | gcc | gag | cgc | 1056 |  |
| Lys | Leu | Arg | Val | Val | Glu | Thr | Gly | Gly | Asn | Ser | Phe | Ala | Ala | Glu | Arg |      |  |
|     |     |     | 340 |     |     |     |     | 345 |     |     |     |     | 350 |     |     |      |  |
| gag | caa | tgg | gac | gac | ggc | aac | aac | gtg | gtc | tgc | ctg | gag | ccg | ggc | gtg | 1104 |  |
| Glu | Gln | Trp | Asp | Asp | Gly | Asn | Asn | Val | Val | Cys | Leu | Glu | Pro | Gly | Val |      |  |
|     |     | 355 |     |     |     |     | 360 |     |     |     |     | 365 |     |     |     |      |  |
| gtg | gtc | ggc | tac | gac | cgc | aac | acc | tac | acc | aac | acc | ctg | ctg | cgc | aag | 1152 |  |
| Val | Val | Gly | Tyr | Asp | Arg | Asn | Thr | Tyr | Thr | Asn | Thr | Leu | Leu | Arg | Lys |      |  |
|     |     | 370 |     |     |     | 375 |     |     |     |     | 380 |     |     |     |     |      |  |
| gcc | ggc | gtc | gag | gtc | atc | acc | atc | agc | gcc | agc | gaa | ctg | ggc | cgc | ggc | 1200 |  |
| Ala | Gly | Val | Glu | Val | Ile | Thr | Ile | Ser | Ala | Ser | Glu | Leu | Gly | Arg | Gly |      |  |
| 385 |     |     |     |     | 390 |     |     |     |     | 395 |     |     |     |     | 400 |      |  |
| cgc | ggc | ggc | ggc | cac | tgc | atg | acc | tgc | ccg | atc | gtc | cgc | gac | ccg | atc | 1248 |  |
| Arg | Gly | Gly | Gly | His | Cys | Met | Thr | Cys | Pro | Ile | Val | Arg | Asp | Pro | Ile |      |  |

405

410

415

gac tac tga  
Asp Tyr

1257

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<213> P. aeruginosa

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Thr Pro Ser Asn Cys Asp Glu Leu Leu Phe Asp Asp Val Ile Trp Val  
35 40 45  
Asn Gln Ala Lys Arg Asp His Phe Asp Phe Val Thr Lys Met Arg Glu  
50 55 60  
Arg Gly Ile Asp Val Leu Glu Met His Asn Leu Thr Glu Thr Ile  
65 70 75 80  
Gln Asn Pro Glu Ala Leu Lys Trp Ile Leu Asp Arg Lys Ile Thr Ala  
85 90 95  
Asp Ser Val Gly Leu Gly Leu Thr Ser Glu Leu Arg Ser Trp Leu Glu  
100 105 110  
Ser Leu Glu Pro Arg Lys Leu Ala Glu Tyr Leu Ile Gly Gly Val Ala  
115 120 125  
Ala Asp Asp Leu Pro Ala Ser Glu Gly Ala Asn Ile Leu Lys Met Tyr  
130 135 140  
Arg Glu Tyr Leu Gly His Ser Ser Phe Leu Leu Pro Pro Leu Pro Asn  
145 150 155 160  
Thr Gln Phe Thr Arg Asp Thr Thr Cys Trp Ile Tyr Gly Gly Val Thr  
165 170 175  
Leu Asn Pro Met Tyr Trp Pro Ala Arg Arg Gln Glu Thr Leu Leu Thr  
180 185 190  
Thr Ala Ile Tyr Lys Phe His Pro Glu Phe Ala Asn Ala Glu Phe Glu  
195 200 205  
Ile Trp Tyr Gly Asp Pro Asp Lys Asp His Gly Ser Ser Thr Leu Glu  
210 215 220  
Gly Gly Asp Val Met Pro Ile Gly Asn Gly Val Val Leu Ile Gly Met  
225 230 235 240



tgctgatggt tggcgaaagg gtgttggcgg gctacggctt tcgcacagac cagcgcgcac 540  
 acgccgaaat cgccgcggtg cttggtctgc cgggtgtctc cctcgagttg gtcgacccac 600  
 ggttctatca cctggacacc gcgctggcgg tgctcgacga ccacacgac gcctactacc 660  
 cgccggcggt cagtacggca gcgcaggaac agttgtcggc gctgttcccc gacgcgattg 720  
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 cggtcggtgt cgatctgtcc gagctgtca agggcggcgg ttccgtcaag tgctgcacgc 900  
 tggagataca cccatgacaa atctcgcgga tgccactcag gccactatgg cactgggtcga 960  
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 <213> M. tuberculosis

<400> 12

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| Asn | Val | Ser | Met | Glu | Asn | Thr | Gln | Arg | Pro | Ser | Phe | Asp | Cys | Glu | Ile |
| 1   |     |     |     | 5   |     |     |     |     | 10  |     |     |     |     | 15  |     |
| Arg | Ala | Lys | Tyr | Arg | Trp | Phe | Met | Thr | Asp | Ser | Tyr | Val | Ala | Ala | Ala |
|     |     |     | 20  |     |     |     |     | 25  |     |     |     |     | 30  |     |     |
| Arg | Leu | Gly | Ser | Pro | Ala | Arg | Arg | Thr | Pro | Arg | Thr | Arg | Arg | Tyr | Ala |
|     |     | 35  |     |     |     |     |     | 40  |     |     |     | 45  |     |     |     |
| Met | Thr | Pro | Pro | Ala | Phe | Phe | Ala | Val | Ala | Tyr | Ala | Ile | Asn | Pro | Trp |
|     | 50  |     |     |     |     | 55  |     |     |     |     | 60  |     |     |     |     |
| Met | Asp | Val | Thr | Ala | Pro | Val | Asp | Val | Gln | Val | Ala | Gln | Ala | Gln | Trp |
| 65  |     |     |     |     | 70  |     |     |     |     | 75  |     |     |     | 80  |     |
| Glu | His | Leu | His | Gln | Thr | Tyr | Leu | Arg | Leu | Gly | His | Ser | Val | Asp | Leu |
|     |     |     |     | 85  |     |     |     |     | 90  |     |     |     |     | 95  |     |
| Ile | Glu | Pro | Ile | Ser | Gly | Leu | Pro | Asp | Met | Val | Tyr | Thr | Ala | Asn | Gly |
|     |     |     | 100 |     |     |     |     | 105 |     |     |     |     |     | 110 |     |
| Gly | Phe | Ile | Ala | His | Asp | Ile | Ala | Val | Val | Ala | Arg | Phe | Arg | Phe | Pro |
|     |     | 115 |     |     |     |     | 120 |     |     |     |     | 125 |     |     |     |
| Glu | Arg | Ala | Gly | Glu | Ser | Arg | Ala | Tyr | Ala | Ser | Trp | Met | Ser | Ser | Val |
|     | 130 |     |     |     |     | 135 |     |     |     |     | 140 |     |     |     |     |
| Gly | Tyr | Arg | Pro | Val | Thr | Thr | Arg | His | Val | Asn | Glu | Gly | Gln | Gly | Asp |
| 145 |     |     |     |     | 150 |     |     |     |     | 155 |     |     |     | 160 |     |
| Leu | Leu | Met | Val | Gly | Glu | Arg | Val | Leu | Ala | Gly | Tyr | Gly | Phe | Arg | Thr |

| 165 |     |     |     |     |     |     |     |     |     | 170 |     |     |     |     | 175 |  |  |  |  |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|--|--|--|
| Asp | Gln | Arg | Ala | His | Ala | Glu | Ile | Ala | Ala | Val | Leu | Gly | Leu | Pro | Val |  |  |  |  |
|     |     |     | 180 |     |     |     |     | 185 |     |     |     |     | 190 |     |     |  |  |  |  |
| Val | Ser | Leu | Glu | Leu | Val | Asp | Pro | Arg | Phe | Tyr | His | Leu | Asp | Thr | Ala |  |  |  |  |
|     |     | 195 |     |     |     |     | 200 |     |     |     |     | 205 |     |     |     |  |  |  |  |
| Leu | Ala | Val | Leu | Asp | Asp | His | Thr | Ile | Ala | Tyr | Tyr | Pro | Pro | Ala | Phe |  |  |  |  |
|     | 210 |     |     |     |     | 215 |     |     |     |     | 220 |     |     |     |     |  |  |  |  |
| Ser | Thr | Ala | Ala | Gln | Glu | Gln | Leu | Ser | Ala | Leu | Phe | Pro | Asp | Ala | Ile |  |  |  |  |
| 225 |     |     |     |     | 230 |     |     |     |     | 235 |     |     |     |     | 240 |  |  |  |  |
| Val | Val | Gly | Ser | Ala | Asp | Ala | Phe | Val | Phe | Gly | Leu | Asn | Ala | Val | Ser |  |  |  |  |
|     |     |     |     | 245 |     |     |     |     | 250 |     |     |     |     | 255 |     |  |  |  |  |
| Asp | Gly | Leu | Asn | Val | Val | Leu | Pro | Val | Ala | Ala | Met | Gly | Phe | Ala | Ala |  |  |  |  |
|     |     |     | 260 |     |     |     |     | 265 |     |     |     |     |     | 270 |     |  |  |  |  |
| Gln | Leu | Arg | Ala | Ala | Gly | Phe | Glu | Pro | Val | Gly | Val | Asp | Leu | Ser | Glu |  |  |  |  |
|     |     | 275 |     |     |     |     | 280 |     |     |     |     | 285 |     |     |     |  |  |  |  |
| Leu | Leu | Lys | Gly | Gly | Gly | Ser | Val | Lys | Cys | Cys | Thr | Leu | Glu | Ile | His |  |  |  |  |
|     | 290 |     |     |     |     | 295 |     |     |     |     | 300 |     |     |     |     |  |  |  |  |

Pro  
305

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<211> 282  
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<213> M. tuberculosis

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Arg Thr Pro Arg Thr Arg Arg Tyr Ala Met Thr Pro Pro Ala Phe Phe  
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Ala Val Ala Tyr Ala Ile Asn Pro Trp Met Asp Val Thr Ala Pro Val  
35 40 45

Asp Val Gln Val Ala Gln Ala Gln Trp Glu His Leu His Gln Thr Tyr  
50 55 60

Leu Arg Leu Gly His Ser Val Asp Leu Ile Glu Pro Ile Ser Gly Leu  
65 70 75 80

Pro Asp Met Val Tyr Thr Ala Asn Gly Gly Phe Ile Ala His Asp Ile  
85 90 95

Ala Val Val Ala Arg Phe Arg Phe Pro Glu Arg Ala Gly Glu Ser Arg  
100 105 110

Ala Tyr Ala Ser Trp Met Ser Ser Val Gly Tyr Arg Pro Val Thr Thr



115                      120                      125  
 Arg His Val Asn Glu Gly Gln Gly Asp Leu Leu Met Val Gly Glu Arg  
 130                      135                      140  
 Val Leu Ala Gly Tyr Gly Phe Arg Thr Asp Gln Arg Ala His Ala Glu  
 145                      150                      155                      160  
 Ile Ala Ala Val Leu Gly Leu Pro Val Val Ser Leu Glu Leu Val Asp  
 165                      170                      175  
 Pro Arg Phe Tyr His Leu Asp Thr Ala Leu Ala Val Leu Asp Asp His  
 180                      185                      190  
 Thr Ile Ala Tyr Tyr Pro Pro Ala Phe Ser Thr Ala Ala Gln Glu Gln  
 195                      200                      205  
 Leu Ser Ala Leu Phe Pro Asp Ala Ile Val Val Gly Ser Ala Asp Ala  
 210                      215                      220  
 Phe Val Phe Gly Leu Asn Ala Val Ser Asp Gly Leu Asn Val Val Leu  
 225                      230                      235                      240  
 Pro Val Ala Ala Met Gly Phe Ala Ala Gln Leu Arg Ala Ala Gly Phe  
 245                      250                      255  
 Glu Pro Val Gly Val Asp Leu Ser Glu Leu Leu Lys Gly Gly Gly Ser  
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 Val Lys Cys Cys Thr Leu Glu Ile His Pro  
 275                      280

<210> 14  
 <211> 285  
 <212> PRT  
 <213> Rattus norvegicus

<400> 14

Met Ala Gly Leu Ser His Pro Ser Val Phe Gly Arg Ala Thr His Ala  
 1                      5                      10                      15  
 Val Val Arg Ala Pro Pro Glu Ser Leu Cys Arg His Ala Leu Arg Arg  
 20                      25                      30  
 Ser Gln Gly Glu Glu Val Asp Phe Ala Arg Ala Glu Arg Gln His Gln  
 35                      40                      45  
 Leu Tyr Val Gly Val Leu Gly Ser Lys Leu Gly Leu Gln Val Val Gln  
 50                      55                      60  
 Leu Pro Ala Asp Glu Ser Leu Pro Asp Cys Val Phe Val Glu Asp Val  
 65                      70                      75                      80  
 Ala Val Val Cys Glu Glu Thr Ala Leu Ile Thr Arg Pro Gly Ala Pro  
 85                      90                      95

Ser Arg Arg Lys Glu Val Asp Met Met Lys Glu Ala Leu Glu Lys Leu  
100 105 110

Gln Leu Asn Ile Val Glu Met Lys Asp Glu Asn Ala Thr Leu Asp Gly  
115 120 125

Gly Asp Val Leu Phe Thr Gly Arg Glu Phe Phe Val Gly Leu Ser Lys  
130 135 140

Arg Thr Asn Gln Arg Gly Ala Glu Ile Leu Ala Asp Thr Phe Lys Asp  
145 150 155 160

Tyr Ala Val Ser Thr Val Pro Val Ala Asp Ser Leu His Leu Lys Ser  
165 170 175

Phe Cys Ser Met Ala Gly Pro Asn Leu Ile Ala Ile Gly Ser Ser Glu  
180 185 190

Ser Ala Gln Lys Ala Leu Lys Ile Met Gln Gln Met Ser Asp His Arg  
195 200 205

Tyr Asp Lys Leu Thr Val Pro Asp Asp Met Ala Ala Asn Cys Ile Tyr  
210 215 220

Leu Asn Ile Pro Ser Lys Gly His Val Leu Leu His Arg Thr Pro Glu  
225 230 235 240

Glu Tyr Pro Glu Ser Ala Lys Val Tyr Glu Lys Leu Lys Asp His Leu  
245 250 255

Leu Ile Pro Val Ser Asn Ser Glu Met Glu Lys Val Asp Gly Leu Leu  
260 265 270

Thr Cys Cys Ser Val Phe Ile Asn Lys Lys Thr Asp Ser  
275 280 285

<210> 15

<211> 72

<212> PRT

<213> Homo sapiens

<400> 15

Asn Ala Thr Leu Asp Gly Gly Asp Val Leu Phe Thr Gly Arg Glu Phe  
1 5 10 15

Phe Val Gly Leu Ser Lys Arg Thr Asn Gln Arg Gly Ala Glu Ile Leu  
20 25 30

Ala Asp Thr Phe Lys Asp Tyr Ala Val Ser Thr Val Pro Val Ala Asp  
35 40 45

Gly Leu His Leu Lys Ser Phe Cys Ser Met Ala Gly Pro Asn Leu Ile  
50 55 60

Ala Ile Gly Ser Ser Glu Ser Ala  
65 70

<210> 16  
<211> 72  
<212> PRT  
<213> Homo sapiens

<400> 16  
Asn Ala Thr Leu Asp Gly Thr Asp Val Leu Phe Thr Gly Arg Glu Phe  
1 5 10 15  
Phe Val Gly Leu Ser Lys Trp Thr Asn His Arg Gly Ala Glu Ile Val  
20 25 30  
Ala Asp Thr Phe Arg Asp Phe Ala Val Ser Thr Val Pro Val Ser Gly  
35 40 45  
Pro Ser His Leu Arg Gly Leu Cys Gly Met Gly Gly Pro Arg Thr Val  
50 55 60  
Val Ala Gly Ser Ser Asp Ala Ala  
65 70

<210> 17  
<211> 80  
<212> PRT  
<213> Pseudomonas aeruginosa

<400> 17  
Asn Ala Thr Leu Glu Gly Gly Asp Val Met Pro Val Gly Lys Gly Ile  
1 5 10 15  
Val Leu Ile Gly Met Gly Glu Arg Thr Ser Arg His Ala Ile Gly Gln  
20 25 30  
Leu Ala Gln Asn Leu Phe Glu Lys Gly Ala Ala Glu Lys Ile Ile Val  
35 40 45  
Ala Gly Leu Pro Lys Ser Arg Ala Ala Met His Leu Asp Thr Val Phe  
50 55 60  
Ser Phe Cys Asp Arg Asp Leu Val Thr Val Phe Pro Glu Val Val Lys  
65 70 75 80

<210> 18  
<211> 356  
<212> PRT  
<213> P. aeruginosa

<400> 18  
Met Ser Thr Glu Lys Thr Lys Leu Gly Val His Ser Glu Ala Gly Lys  
1 5 10 15  
Leu Arg Lys Val Met Val Cys Ser Pro Gly Leu Ala His Gln Arg Leu  
20 25 30  
Thr Pro Ser Asn Cys Asp Glu Leu Leu Phe Asp Asp Val Ile Trp Val  
35 40 45

Asn Gln Ala Lys Arg Asp His Phe Asp Phe Val Thr Lys Met Arg Glu  
 50 55 60  
 Arg Gly Ile Asp Val Leu Glu Met His Asn Leu Leu Thr Glu Thr Ile  
 65 70 75 80  
 Gln Asn Pro Glu Ala Leu Lys Trp Ile Leu Asp Arg Lys Ile Thr Ala  
 85 90 95  
 Asp Ser Val Gly Leu Gly Leu Thr Ser Glu Leu Arg Ser Trp Leu Glu  
 100 105 110  
 Ser Leu Glu Pro Arg Lys Leu Ala Glu Tyr Leu Ile Gly Gly Val Ala  
 115 120 125  
 Ala Asp Asp Leu Pro Ala Ser Glu Gly Ala Asn Ile Leu Lys Met Tyr  
 130 135 140  
 Arg Glu Tyr Leu Gly His Ser Ser Phe Leu Leu Pro Pro Leu Pro Asn  
 145 150 155 160  
 Thr Gln Phe Thr Arg Asp Thr Thr Cys Trp Ile Tyr Gly Gly Val Thr  
 165 170 175  
 Leu Asn Pro Met Tyr Trp Pro Ala Arg Arg Gln Glu Thr Leu Leu Thr  
 180 185 190  
 Thr Ala Ile Tyr Lys Phe His Pro Glu Phe Ala Asn Ala Glu Phe Glu  
 195 200 205  
 Ile Trp Tyr Gly Asp Pro Asp Lys Asp His Gly Ser Ser Thr Leu Glu  
 210 215 220  
 Gly Gly Asp Val Met Pro Ile Gly Asn Gly Val Val Leu Ile Gly Met  
 225 230 235 240  
 Gly Glu Arg Ser Ser Arg Gln Ala Ile Gly Gln Val Ala Gln Ser Leu  
 245 250 255  
 Phe Ala Lys Gly Ala Ala Glu Arg Val Ile Val Ala Gly Leu Pro Lys  
 260 265 270  
 Ser Arg Ala Ala Met His Leu Asp Thr Val Phe Ser Phe Cys Asp Arg  
 275 280 285  
 Asp Leu Val Thr Val Phe Pro Glu Val Val Lys Glu Ile Val Pro Phe  
 290 295 300  
 Ser Leu Arg Pro Asp Pro Ser Ser Pro Tyr Gly Met Asn Ile Arg Arg  
 305 310 315 320  
 Glu Glu Lys Thr Phe Leu Glu Val Val Ala Glu Ser Leu Gly Leu Lys  
 325 330 335  
 Lys Leu Arg Val Val Glu Thr Gly Gly Asn Ser Phe Ala Ala Glu Arg  
 340 345 350

Glu Gln Trp Asp  
355

<210> 19  
<211> 202  
<212> PRT  
<213> *P. aeruginosa*

<400> 19  
Met Phe Lys His Ile Ile Ala Arg Thr Pro Ala Arg Ser Leu Val Asp  
1 5 10 15  
Gly Leu Thr Ser Ser His Leu Gly Lys Pro Asp Tyr Ala Lys Ala Leu  
20 25 30  
Glu Gln His Asn Ala Tyr Ile Arg Ala Leu Gln Thr Cys Asp Val Asp  
35 40 45  
Ile Thr Leu Leu Pro Pro Asp Glu Arg Phe Pro Asp Ser Val Phe Val  
50 55 60  
Glu Asp Pro Val Leu Cys Thr Ser Arg Cys Ala Ile Ile Thr Arg Pro  
65 70 75 80  
Gly Ala Glu Ser Arg Arg Gly Glu Thr Glu Ile Ile Glu Glu Thr Val  
85 90 95  
Gln Arg Phe Tyr Pro Gly Lys Val Glu Arg Ile Glu Ala Pro Gly Thr  
100 105 110  
Val Glu Ala Gly Asp Ile Met Met Val Gly Asp His Phe Tyr Ile Gly  
115 120 125  
Glu Ser Ala Arg Thr Asn Ala Glu Gly Ala Arg Gln Met Ile Ala Ile  
130 135 140  
Leu Glu Lys His Gly Leu Ser Gly Ser Val Val Arg Leu Glu Lys Val  
145 150 155 160  
Leu His Leu Lys Thr Gly Leu Ala Tyr Leu Glu His Asn Asn Leu Leu  
165 170 175  
Ala Ala Gly Glu Phe Val Ser Lys Pro Glu Phe Gln Asp Phe Asn Ile  
180 185 190  
Ile Glu Ile Pro Glu Glu Glu Ser Tyr Ala  
195 200

<210> 20  
<211> 21  
<212> DNA  
<213> artificial sequence

<220>  
<223> PCR primer homologous to nucleotides 303-324 of human DDAH1  
<400> 20

ggttgacatg atgaaagaag c 21

<210> 21  
 <211> 20  
 <212> DNA  
 <213> artificial sequence

<220>  
 <223> PCR primer homologous to nucleotides 454-435 of human DDAHI

<400> 21  
 cagcaccgccg ttgatttgtc 20

<210> 22  
 <211> 21  
 <212> DNA  
 <213> artificial sequence

<220>  
 <223> PCR primer homologous to nucleotides 324-303 of human DDAHI

<400> 22  
 gcttctttca tcatgtcaac c 21

<210> 23  
 <211> 21  
 <212> DNA  
 <213> artificial sequence

<220>  
 <223> PCR primer homologous to nucleotides 682-703 of human DDAHI

<400> 23  
 cccaacaaag ggcacgtctt g 21

<210> 24  
 <211> 28  
 <212> DNA  
 <213> artificial sequence

<220>  
 <223> PCR primer homologous to nucleotides -2-15 of human DDAHII encoding an upstream EcoRI site

<400> 24  
 gatcgaattc aggatgggga cgccgggg 28

<210> 25  
 <211> 26  
 <212> DNA  
 <213> artificial sequence

<220>  
 <223> PCR primer homologous to nucleotides 858-840 of human DDAHII encoding a downstream XbaI site

<400> 25

gacttctaga gctgtggggg cgtgtg 26

<210> 26  
 <211> 21  
 <212> DNA  
 <213> artificial sequence

<220>  
 <223> PCR primer homologous to nucleotides 813-834 of human DDAHII

<400> 26  
 ctcagctccc tctgcttggt g 21

<210> 27  
 <211> 21  
 <212> DNA  
 <213> artificial sequence

<220>  
 <223> PCR primer homologous to nucleotides 1003-1024 of human DDAHII

<400> 27  
 gagggaggat tcacccagtg g 21

<210> 28  
 <211> 24  
 <212> DNA  
 <213> artificial sequence

<220>  
 <223> PCR primer homologous to nucleotides -12-12 of rat DDAHI

<400> 28  
 tccgcgggat ccatggcgg cctc 24

<210> 29  
 <211> 28  
 <212> DNA  
 <213> artificial sequence

<220>  
 <223> PCR primer homologous to nucleotides 872-844 of rat DDAHI

<400> 29  
 cgctcgggtct agatcaagag tctgtctt 28

<210> 30  
 <211> 24  
 <212> DNA  
 <213> artificial sequence

<220>  
 <223> PCR primer homologous to nucleotides 4079-4102 of human nNOS

<400> 30  
 ctgctgatgt cctcaaagcc atcc 24

<210> 31  
 <211> 24  
 <212> DNA  
 <213> artificial sequence  
  
 <220>  
 <223> PCR primer homologous to nucleotides 4353-4330 of human nNOS  
  
 <400> 31  
 tctgtcccgc gcttacaaac ttgc 24  
  
 <210> 32  
 <211> 24  
 <212> DNA  
 <213> artificial sequence  
  
 <220>  
 <223> PCR primer homologous to nucleotides 3379-3402 of human eNOS  
  
 <400> 32  
 caaccaacgt cctgcagacc gtgc 24  
  
 <210> 33  
 <211> 24  
 <212> DNA  
 <213> artificial sequence  
  
 <220>  
 <223> PCR primer homologous to nucleotides 3690-3667 of human eNOS  
  
 <400> 33  
 ggcggaacctg agtcgggcag ccgc 24  
  
 <210> 34  
 <211> 39  
 <212> DNA  
 <213> artificial sequence  
  
 <220>  
 <223> 5'/3' RACE oligo d(T) anchor primer  
  
 <400> 34  
 gaccacgcgt atcgatgtcg actttttttt ttttttttv 39  
  
 <210> 35  
 <211> 22  
 <212> DNA  
 <213> artificial sequence  
  
 <220>  
 <223> 5'/3' RACE anchor primer  
  
 <400> 35  
 gaccacgcgt atcgatgtcg ac 22  
  
 <210> 36  
 <211> 29



<212> DNA  
 <213> artificial sequence

<220>  
 <223> PCR primer homologous to nucleotides -9-20 of *S. coelicolor* DDAH encoding an upstream EcoRI site

<400> 36  
 gatcgaattg tgcccagcaa gaaggcctg 29

<210> 37  
 <211> 29  
 <212> DNA  
 <213> artificial sequence

<220>  
 <223> PCR primer homologous to nucleotides 732-751 of *S. coelicolor* DDAH encoding a downstream XbaI site

<400> 37  
 gatctctaga tcagtcgtac agctcgcgc 29

<210> 38  
 <211> 25  
 <212> DNA  
 <213> artificial sequence

<220>  
 <223> PCR primer homologous to nucleotides 1-19 of *P. aeruginosa* DDAH encoding an upstream EcoRI site

<400> 38  
 gaattcatgt tcaagcacat catcg 25

<210> 39  
 <211> 22  
 <212> DNA  
 <213> artificial sequence

<220>  
 <223> PCR primer homologous to nucleotides 782-768 of *P. aeruginosa* DDAH encoding a downstream HindIII site

<400> 39  
 aagcttcgcc gcggcatggt tc 22

<210> 40  
 <211> 22  
 <212> DNA  
 <213> artificial sequence

<220>  
 <223> PCR primer homologous to nucleotides -12-4 of *T. tuberculosis* DDAH encoding an upstream EcoRI site

<400> 40

gaattccgca atgtatcaat gg

22

<210> 41

<211> 20

<212> DNA

<213> artificial sequence

<220>

<223> PCR primer homologous to nucleotides 1024-1011 of T. tuberculosis DDAH encoding a downstream HindIII site

<400> 41

aagttccac gcaccctcag

20

<210> 42

<211> 24

<212> DNA

<213> artificial sequence

<220>

<223> PCR primer homologous to nucleotides 3-22 of P. aeruginosa Deiminase encoding an upstream EcoRI site

<400> 42

gaattcagca cggaaaaacc aaac

24

<210> 43

<211> 25

<212> DNA

<213> artificial sequence

<220>

<223> PCR primer homologous to nucleotides 1257-1239 of P. aeruginosa Deiminase encoding a downstream HindIII site

<400> 43

aagcttgtag tcgatcgggt cgc

23